

Effect of Zinc Oxide on Characteristics of Active Flux TIG Welds of 1050 Aluminum Plates

Authors : H. Fazlinejad, A. Halvae

Abstract : In this study, characteristics of ATIG welds using ZnO flux on aluminum was investigated and compared with TIG welds. Autogenously AC-ATIG bead on plate welding was applied on Al1050 plate with a coating of ZnO as the flux. Different levels of welding current and flux layer thickness was considered to study the effect of heat input and flux quantity on ATIG welds and was compared with those of TIG welds. Geometrical investigation of the weld cross sections revealed that penetration depth of the ATIG welds with ZnO flux, was increased up to 2 times in some samples compared to the TIG welds. Optical metallographic and Scanning Electron Microscopy (SEM) observations revealed similar microstructures in TIG and ATIG welds. Composition of the ATIG welds slag was also analyzed using X-ray diffraction. In both TIG and ATIG samples, the lowest values of microhardness were observed in the HAZ.

Keywords : ATIG, active flux, weld penetration, Al 1050, ZnO

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